#### (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

# (19) World Intellectual Property Organization International Bureau



### 

(43) International Publication Date 13 January 2005 (13.01.2005)

PCT

## (10) International Publication Number WO 2005/003803 A1

(51) International Patent Classification<sup>7</sup>: G01R 33/561

(21) International Application Number:

PCT/CH2004/000386

(22) International Filing Date: 24 June 2004 (24.06.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 03015094.0

3 July 2003 (03.07.2003) E

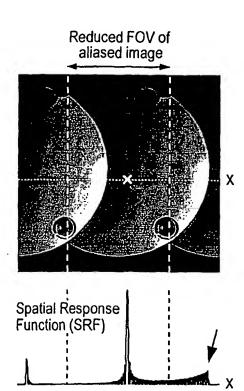
- (71) Applicants (for all designated States except US): UNI-VERSITÄT ZÜRICH [CH/CH]; Prorektorat Forschung, Rämistrasse 71, CH-8006 Zürich (CH). ETH ZÜRICH [CH/CH]; ETH Transfer, Rämistrasse 101, CH-8092 Zürich (CH).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): PRUESSMANN,

Klaas [DE/CH]; Hopfenstrasse 15, CH-8045 Zürich (CH). TSAO, Jeffrey [CA/CH]; Gempenstrasse 46, CH-4053 Basel (CH).

- (74) Agent: SPIERENBURG & PARTNER AG; Mellingerstrasse 12, CH-5443 Niederrohrdorf (CH).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, IP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: MINIMUM NORM SENCE RECONSTRUCTION FOR OPTIMAL SPATIAL RESPONSE



(57) Abstract: A novel magnetic resonance imaging method is described, wherein undersampled magnetic resonance signals are acquired by a receiver antenna system having spatial sensitivity profiles and the image being reconstructed from the undersampled magnetic resonance signals and the spatial sensitivity profiles. The reconstruction of the image is provided by an optimization of a cost function which accounts for any of noise statistics, signal statistics, and the spatial response function, the latter of which is defined by the spatial signal response from the object to be imaged, separately for each individual pixel.

**BEST AVAILABLE COPY** 

WO 2005/003803 A1

### I COLIT BRIDGE O COLIT COLITICOLITI ENDI ENDI ENDI ENDI ENDI BOLLER ROLLITI ENDI COLITICOLITI WO 2005/003803 A1

FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, ning of each regular issue of the PCT Gazette. GW, ML, MR, NE, SN, TD, TG).

European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the begin-

### Published:

with international search report